American River Basin: Upper Unionhouse Creek Flood Protection Project

Attachment 3: Work Plan

Introduction

The American River Basin (ARB) Integrated Regional Water Management (IRWM) planning region, approved by the California Department of Water Resources (DWR) during the 2009 Region Acceptance Process (RAP), covers a geographic area of more than 1,200 square miles with a population of more than 1.5 million inhabitants (see Figure 1). At the heart of the region are the lower American and Cosumnes Rivers. The lower American River is the only nationally-designated wild and scenic river running through a major metropolitan area in the United States, and the Cosumnes River is the only river on the western slope of the Sierra Nevada without a large rim dam. Being at the intersection of a large urban population and the valuable natural resources within the region has presented many challenges to a sustainable water supply, including:

- increasing the potential for flooding-related damages as urban growth moves closer to the rivers;
- keeping supply paced with some of the fastest growth areas in the State;
- substantial cones of depression in the underlying groundwater basins;
- regionally-extensive groundwater contaminant plumes resulting from defense-related activities; and
- the need to balance environmental and water supply needs.

These challenges could have thrown the region into a crisis resulting in gridlocked water supplies and environmental degradation. Instead, beginning in 1993, regional stakeholders from a broad spectrum of interests came together to negotiate, for nearly seven years, a balanced solution for future water supply and environmental protection. The result was the landmark April 2000 Water Forum Agreement (WFA), which was signed by 40 stakeholder groups from a diverse representation of local government, environment, and business interests from Sacramento, Placer and El Dorado Counties. The WFA brought forth a new era of regional planning and collaboration based on two co-equal objectives:

1. Provide a reliable water supply for planned development to the year 2030; and
2. Protect and preserve the Lower American River.

In 2001, the Regional Water Authority (RWA) was formed as a joint powers authority (JPA) to assist local purveyors in the planning needed to implement the WFA. In 2004, RWA launched its initial effort to begin developing an IRWM planning region centered primarily on the stakeholders and projects involved in the Water Forum process. This resulted in the adoption in 2006 of the *American River Basin Integrated Regional Water Management Plan* (ARB IRWMP). RWA began the process of comprehensively updating its IRWM Plan using planning and stakeholder forums identified in its RAP application in 2009. Through these forums, the breadth of the planning effort has expanded beyond just the stakeholders involved in the Water Forum process to a much broader group of interests. The current geographic and demographic composition of the ARB IRWM region presents great opportunity to benefit local water supply for all users, expand habitat, improve flood protection, and ultimately provide benefits

to the Sacramento-San Joaquin Delta adjacent to the region, which is partially within and primarily immediately downstream of the region.

The Upper Unionhouse Creek Flood Protection Project, included in this Proposition (Prop) 1E IRWM Stormwater Grant Program Proposal (Proposal) was one of three stormwater-related projects identified through an inclusive stakeholder process (described in Attachment 1 of this Proposal). These three projects (the Upper Unionhouse Creek Flood Protection Project , the Antelope Creek Improvement Project, and the Downtown Combined Sewer Upsizing Project) are each included in a separate proposal and contribute significantly to the Program Preferences included in the *Proposition 84 & Proposition 1E IRWM Guidelines* (DWR, August 2010). Each are discussed further in this attachment.

The Sacramento Area Flood Control Agency is submitting this Proposal on behalf of itself and the rest of the ARB IRWM Planning Region to request $976,773 in grant funding to implement the project described herein.

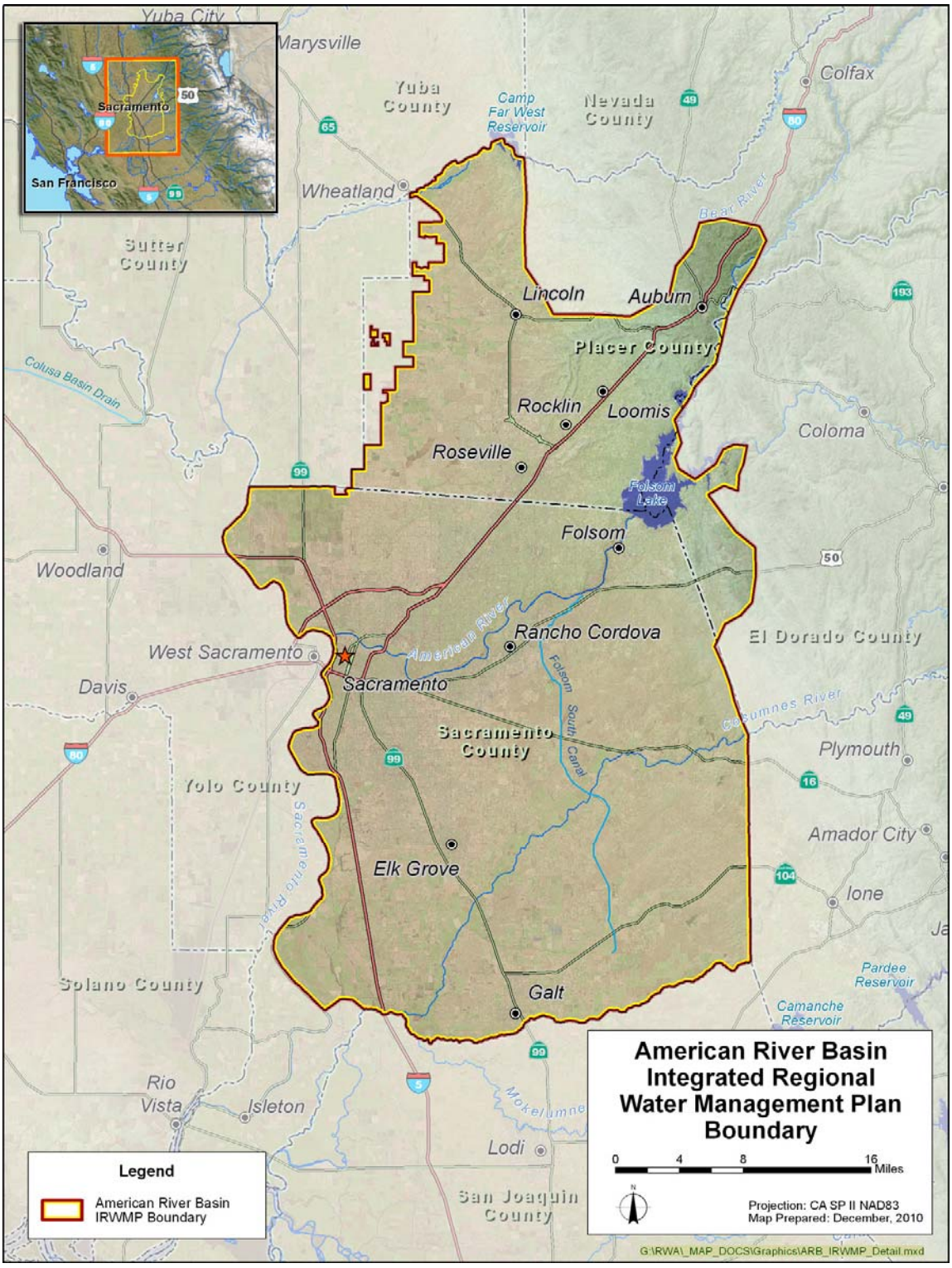

Figure 1: ARB IRWMP Region Boundaries

Goals and Objectives

The goal of this Proposal is to implement the current stormwater-related priority projects that best contribute to meeting the ARB IRWM objectives. While RWA is currently leading an effort to comprehensively update the American River Basin IRWM Plan to meet revised State standards, the objectives identified in the IRWM Plan adopted in May 2006 all serve to meet the adopted IRWM's mission "to preserve the economic and environmental health and well being of the region through the development of a program that focuses on watershed stewardship and comprehensive management of water resources in a reliable, cost effective, and responsible manner." The IRWM Plan Update will serve to update, expand, and quantify the existing objectives. The current adopted objectives of the ARB IRWM Plan include:

Stormwater and Floodplain Management – Provide the highest practicable level of achieving flood control and stormwater quality in the region.

Water Supply – Plan for and implement programs and projects that develop the highest level of reliability in public drinking water suppliers and equitably distribute capital and operating costs.

Groundwater Management – Protect and enhance groundwater resources and groundwater quality in accordance with adopted Groundwater Management Plans in the region.

Ecosystem Restoration – Coordinate with agencies developing plans that identify and implement ecosystem restoration projects along sensitive wildlife habitat areas in the region and Bay-Delta.

Recycled Water – Move forward in the long term planning of recycled water use to improve water use efficiency in the region, reduce TMDLs for certain constituents in receiving waters of treated wastewater effluent.

Potable Water Quality – Continuously look for innovative solutions in providing the highest level of protection in raw water sources used for potable drinking water supplies.

Other – Implement regional water management strategies that provide the highest level of understanding and financial support for regional programs and projects to meet the ARB IRWM Plan objectives**.**

This project was selected as it helps the ARB Region towards achieving this goal. Specifically, the goals and objectives of the Upper Unionhouse Creek Flood Protection Project include:

- Extending 100-year flood protection to 250 to 300 homes currently in the 100-year floodplain.
- Contributing to a solution to flooding concerns which are preventing Sacramento Regional Transit District from connecting Downtown Sacramento to Cosumnes River College.
- Reducing the scope and cost of the Federal flood control project to focus remaining funding on creeks north of Unionhouse Creek in the Morrison Creek watershed

Purpose and Need

The purpose of this Proposal for the Upper Unionhouse Creek Flood Protection Project, and the corresponding proposals for the Antelope Creek Improvement Project and Sacramento Downtown Combined Sewer Upsizing Project, is to continue implementation of the vision of Integrated Water Resources Management initially visualized by the ARB Region through the development of the Water Forum Agreement, and being promoted by the State to ensure sustainable water supplies for future generations. The ARB Region has greatly expanded its outreach to stakeholders and has found that there is tremendous need to implement projects across a broad spectrum of water interests that will benefit the natural and human environments.

As described in Attachment 1 (Authorization and Eligibility Requirements) of this Proposal, the Upper Unionhouse Creek Flood Protection Project was identified through an open call for projects to representatives of more than 100 distinct stakeholder organizations throughout the region to ensure that the most current projects providing the greatest value to the region were identified and evaluated. This call for projects followed a series of stakeholder meetings on the IRWM Plan and its planned update.

While the IRWM Region's priority projects, such as the Project described herein, address the aforementioned IRWM goals and objectives in multiple ways, the Upper Unionhouse Creek Flood Protection Project, combined with the Antelope Creek Improvement Project and Downtown Combined Sewer Upsizing, achieves significant progress toward meeting these IRWM goals and objectives in water supply, stormwater and floodplain management, ecosystem restoration, recreation and water quality. Each of these is discussed further below.

Stormwater and Floodplain Management

The Antelope Creek Improvement Project improves the ARB Region's stormwater and floodplain management capabilities. The flood control structures on Antelope Creek will reduce the peak flow of a 100-year storm event by as much as 1,000 cubic feet per second (cfs) at critical locations within downtown Roseville. This has significant potential to reduce flood damages for both residential and commercial properties located downstream of the project site both in downtown Roseville and in portions of unincorporated Placer County. Within the region, this is one of the highest priority flood control projects that do not fall within the State Plan of Flood Control.

The Downtown Combined Sewer Upsizing Project will reduce the frequency of combined sewer overflows in the Downtown Sacramento Region by replacing existing pipelines with larger pipes, by paralleling the existing pipeline and/or by connecting new pipes to upsized portions of pipes. These pipeline improvements will eliminate the bottleneck sections of combined sewer pipeline that currently exist and will lower the hydraulic grade line in this portion of the City with critical and high-value real estate that has experienced flooding in the past.

Another critical flood reduction project in the ARB region is the Upper Unionhouse Creek Flood Protection Project. This project will remove 250 to 300 homes from the floodplain, relieving the homeowners of the burden of costly flood insurance. The lower reach of Unionhouse Creek, below Franklin Boulevard has already been improved under the South Sacramento Streams Group (SSSG)

project (Federal Project). The reach between Franklin Boulevard and Center Parkway has been under study as a part of the SSSG, but the project would enable this reach to be removed from the Federal Project, keeping it out of the State Plan of Flood Control and avoiding state liability for its maintenance. The project will solve flooding issues in the project reach at a lower cost than could be achieved with the Federal Project, and removing this reach from the Federal Project will leverage other federal, state and local funds for underfunded flood control needs elsewhere in the Morrison Creek watershed. The channel widening that will be completed as part of the Upper Unionhouse Creek Flood Protection Project will ultimately contain 100-year flows or more in this reach of the creek.

Water Supply

The Antelope Creek Improvement Project will increase the capacity of the region to conjunctively manage its surface water and groundwater resources. The project will impound stormwater behind two new weirs during and following storm events, thereby allowing for groundwater infiltration. Similarly, the removal of sediment from Clover Valley Reservoir will improve the percolation capacity of the bottom of the basin, allowing for improved groundwater recharge. In a similar manner, the widening of Upper Unionhouse Creek as part of the Upper Unionhouse Creek Flood Protection Project will provide for limited earthen areas which will allow for groundwater infiltration during and following storm events.

While the Downtown Combined Sewer Project will not provide any direct water supply benefits, the project will reduce the frequency of raw sewage discharges to the Sacramento River. This river is a major source of water supply for much of the greater Sacramento area, and drinking water intakes do exist downstream of the downtown area. Reducing the frequency of raw sewage discharges to the river will, in turn, reduce the number of times downstream intakes may have to curtail surface water diversions as a result of severe water quality impacts.

Ecosystem Restoration

This Proposal strongly recognizes the relationship between a healthy ecosystem and stormwater runoff management. The Antelope Creek Improvement Project will include aquatic and riparian habitat restoration and improvement as a result of the Clover Valley Reservoir dredging and as part of the weir and intake bypass construction. As part of this project implementation, invasive vegetation will be removed and replaced with native vegetation.

Water Quality

A key aspect of the Antelope Creek Improvement Project, Downtown Combined Sewer Upsizing Project and the Upper Unionhouse Creek Flood Protection Project is the associated improvement in water quality. The Antelope Creek Improvement Project will significantly reduce the sediment loading to Clover Valley Reservoir, and subsequently to downstream reaches of Clover Valley Creek and Antelope Creek. The Downtown Combined Sewer Upsizing Project will significantly reduce the number of raw sewage releases resulting from the combined sewer overflow events, thereby reducing the introduction of bacteria, viruses and other runoff-borne contaminants to the Sacramento River. Finally, the widening of Upper Unionhouse Creek that will occur as part of the Upper Unionhouse Creek Flood Protection Project will slow stormwater flows, thereby allowing for the settling and subsequent removal of pollutants prior to discharges downstream.

Project List

The ARB IRWM planning region is presenting three stormwater and flood reduction projects from its list of priority projects: the Upper Unionhouse Creek Flood Protection Project, the Antelope Creek Improvement Project and the Downtown Combined Sewer Upsizing Project. Once these projects are implemented, the result will be measurable progress towards the Region's overall stormwater and water resource management objectives.

Table 1 summarizes the three projects being put forth by the ARB IRWM planning region; an abstract for each project, the current status of each project in terms of percent completion of design (as of April 2011), and the implementing agencies are noted. Figure 2 displays the project locations and the regional boundaries. Note that these are general project locations. More detail on the project location of the Upper Unionhouse Flood Protection Project is provided in the detailed work plan later in this section. Details on the project locations for the other projects are provided in their respective proposals.

Table 1: ARB Prop 1E Stormwater Project List

Project Name	Abstract	Implementing Agency	Percent Design Complete
Upper Unionhouse Creek Flood Protection Project	Unionhouse Creek is a tributary to Morrison Creek in the southern part of the City of Sacramento and in unincorporated Sacramento County. This creek floods out of bank in 100-year and more frequent storms; an estimated 250 to 300 homes are in the 100-year floodplain. The proposed Upper Unionhouse Creek Flood Protection Project seeks to keep 100-year flood flows within the channel from the confluence of Unionhouse and Strawberry Creeks, downstream to Franklin Boulevard where the federal South Sacramento Streams Group (SSSG) project will commence. The project will remove the 250 to 300 homes from the floodplain, relieving the homeowners of the burden of flood insurance, and removing this project reach from the federal project, which will free up funds for the currently underfunded federal project elements elsewhere within the watershed. The project will resolve flooding issues in the project reach, and removing this reach from the federal project will free up other federal, state and local funds for underfunded flood control projects elsewhere in the Morrison Creek watershed. The Upper Unionhouse Creek Flood Protection Project consists of the widening of Unionhouse Creek between Strawberry Creek and Franklin Boulevard. The channel widening of the Upper Unionhouse Creek Flood Protection Project will contain 100-year flows or more in this reach of the creek.	Sacramento Area Flood Control Agency	Conceptual (10%) Design
Downtown Combined Sewer Upsizing Project	The City of Sacramento's Combined Sewer System (CSS) serves the Downtown, East Sacramento and River Park, Land Park, Curtis Park, and Oak Park neighborhoods and totals 7,500 acres of the City. An additional 3,800 adjacent acres contribute sanitary sewer to the system, but the stormwater drainage is separate. These areas were separated as a result of efforts in the past to improve operational efficiency by diverting drainage and thus reduce the surcharging caused by high runoff flows. The CSS also includes two major pumping plants, Sump 1/1A and Sump 2/2A, and treatment plants that perform primary treatment (the Combined Wastewater Treatment Plant and Pioneer Reservoir). In 1990, the Central Valley Regional Water Quality Control Board (Regional Board) served the City with a Cease and Desist Order that directed the City to devise a plan to reduce its combined sewer overflows (CSOs) and CSS outflows. Over the next four years, the City developed the Combined Sewer System Improvement Program (CSSIP), obtained approval from the Regional Board and City Council, and since then has largely implemented it. This effort, with the ultimate goal of eliminating CSS outflows for 10-year, six hour storms, has resulted thus far in reduction in outflow volumes of about 60% since the inception of Phase 1 of the CSSIP, based upon hydraulic model results. This was achieved by increasing pumping capacity at Sump 1/1A and at Sump 2, and by constructing additional in-line and offline storage. Remaining projects in Phase 1 of the CSSIP mostly consist of completing the Downtown Sewer Upsizing Project, which, thus far, has been designed and constructed in sections due to funding constraints. To complete the Downtown Combined Sewer Upsizing Project, it is necessary to continue the "upsizing" in 7th Street to connect with a section upstream that was constructed out of sequence due to timing constraints, and to extend this network of upsized pipes in L, G, F, and 8th Street. For the project to function properly, it is necessary that it be continuous, without the bottleneck sections that currently exist. Once completed, the network of upsized and parallel pipes will serve to lower the hydraulic grade line in this portion of the City with critical and high value real estate that has experienced flooding of combined sewer in the past. The Downtown Combined Sewer Upsizing Project will be implemented in three phases, replacing existing pipelines with larger pipes, paralleling existing pipeline, or by connecting new pipes to upsized portions, whichever approach is determined to be most practical. Phase 1 of the project will address the pipeline on P Street between 5th and 7th Streets, and on S Street between 14th and 17th Streets. Phase 2 of the project will retrofit or replace the pipeline on 7th Street from P Street to K Street, while Phase 3 of the project will retrofit or replace the pipeline on G Street from 7th Street to 9th Street and on F Street from 13th Street to 15th Street.	City of Sacramento	60% design completed for Phase 1; Phases 2 and 3 are in conceptual design

Project Name	Abstract	Implementing Agency	Percent Design Complete
Antelope Creek Improvement Project	The Antelope Creek Improvement Project is a collaboration between Placer County Water Agency (PCWA) and Placer County Flood Control and Water Conservation District (District). This multi-objective regional flood control, water supply and water quality improvement project is located within the Dry Creek Watershed area of the American River Basin and will be completed in three phases. The project will meet multiple planning objectives by improving water supply and water quality, increasing flood protection, restoring local ecosystems and expanding an existing public recreation corridor. Phases One and Two of this multi-purpose effort include a regional flood control project on Antelope Creek, a major tributary of the larger Dry Creek. Through the design and construction of two on-channel weirs along an existing open space-protected reach of the creek, the project will provide flood control and flood damage reduction benefits to repeatedly damaged areas of downtown Roseville. The project will reduce peak flood flows over a wide range of flood events, improve the timing of flood flows, enhance existing riparian corridor ecosystems, and improve water quality through groundwater recharge and the natural treatment of temporarily-stored flood waters within the floodplain. Both ecosystem restoration and public recreational opportunities will be enhanced wherever possible within the floodplain of Antelope Creek, which currently includes a multi-purpose public trail system. In-stream improvements will include bank re-contouring to ensure overbank flows, specific habitat enhancements for fisheries, removal of invasive plant species and replanting with natives. An interpretive trail sign system and a public trailhead/community node are also proposed to improve access to the multi-purpose trail system while helping to educate the public on the project. The Antelope Creek Improvement Project also includes improvements to the upstream Clover Valley Reservoir, which regulates water deliveries in the lower Antelope Canal and Creek and is operated by PCWA. The unlined portion of the Antelope Canal, near the Union Pacific Railroad track crossing, feeds the reservoir and has experienced severe erosion and down-cutting causing the reservoir to become silted and impairing the reservoir capacity. This phase of the project will construct a pipeline to convey the water from the Antelope Canal to the reservoir to reduce or eliminate erosion, and will include dredging of the reservoir to remove existing sediment and silt, restoring reservoir capacity and improving water quality both in the reservoir and in the downstream creek.	Placer County Flood Control and Water Conservation District & Placer County Water Agency	Conceptual (10%) Design

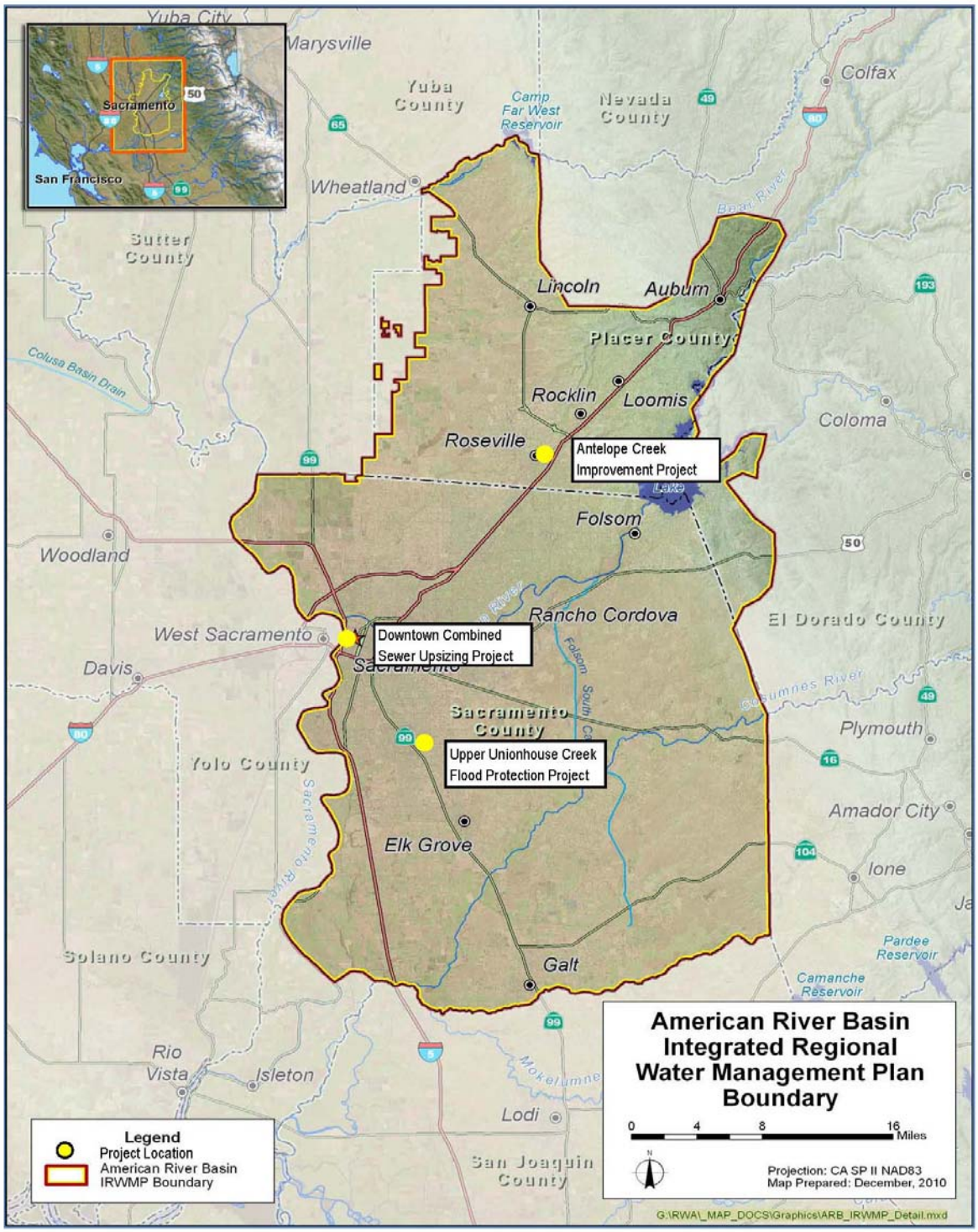

Figure 2: Project Locations and ARB Regional Boundaries

Integrated Elements of Projects

This Proposal for the Upper Unionhouse Creek Flood Protection Project, and its sister proposals for the Antelope Creek Improvement Project and Downtown Combined Sewer Upsizing Project, is highly integrated from a regional perspective (e.g., implementing elements of the Water Forum Agreement and IRWM Plan) and, in many cases, at the project level. Beginning with the Water Forum Agreement (WFA), water managers and planners in the ARB IRWM Region have strived to efficiently utilize the region's precious water resources to ensure a future supply and protect and preserve the natural environment. Through coordinated efforts, integrated regional water management planning has been, and will continue to be, maximized through the use of overarching water management strategies spread throughout the region.

Combining multiple water management strategies to achieve multiple objectives allows for a diversified approach to problem solving. Specifically, the three projects summarized above all link to regional objectives for flood damage reduction, however each project also provides for water quality and/or water supply benefits. These integrated categories are described in more detail below, and where applicable, specific synergies or linkages at the project level are also described.

Protection from flood-related damage is a key goal in the ARB region, given its proximity to several of California's major rivers. As previously noted, the American River Basin is located between some of the Central Valley's most noted rivers, and as such, is acutely aware of the importance the rivers play in the environment – from recreation to critical habitat.

The **Upper Unionhouse Creek Flood Protection Project** is first and foremost a flood damage reduction project. This project will widen Upper Unionhouse Creek between Strawberry Creek and Franklin Boulevard, thereby removing up to 300 houses from the 100-year floodplain for the creek and relieving the homeowners of the burden of flood insurance. The project will also support the development of the currently-threatened extension of the light rail from downtown Sacramento to Cosumnes River College (a project which will reduce pollution and traffic congestion and contribute to sustainable development) by reducing potential flooding impacts to the project, allowing for transportation project funding and permitting. Finally, the project will provide some water quality benefits by slowing the flow of floodwaters in Upper Unionhouse Creek, allowing for the settling of pollutants as the flow moves downstream.

The **Antelope Creek Improvement Project** is a multi-benefit project being proposed by the Placer County Flood Control and Water Conservation District and Placer County Water Agency (PCWA). The benefits of this project are so varied that this project also provides significant Water Supply, Water Quality and Other benefits. The project consists of dredging and improvements to Clover Valley Reservoir, which both supplies PCWA with water supply operational flexibility and improves water supplies through the improvement of the reservoir bottom, allowing for increased groundwater percolation. Additionally, maintenance of the reservoir and construction of a pipeline bypass from the adjacent canal system to the reservoir extends the life of the project and improves downstream water quality by significantly reducing sediment loading in the reservoir and creek systems. The Antelope Creek Improvement Project also includes the construction of two new weirs on Antelope Creek. These

weirs will create two temporary (seasonal) impoundments on Antelope Creek which will also allow for additional stormwater percolation to local groundwater aquifers, and will remove pollutants from stormwater runoff by stilling water and allowing pollutants to settle from the flows prior to spilling downstream. This project meets multiple planning objectives by also restoring local ecosystems and expanding an existing public recreation corridor. The idea for this project spawned from participation in the ARB IRWM effort.

The **Downtown Combined Sewer Upsizing Project** provides direct relief from combined sewer overflows and flooding in downtown Sacramento. Through the upsizing of undersized sewer pipelines, the project eliminates bottlenecks that currently exist and cause flooding to occur during 10-year 6-hour storm events. Additionally, this project provides significant water quality benefits through the elimination of raw sewage discharges to the adjacent Sacramento River and by minimizing the potential for the public to come into contact with raw sewage (e.g. reducing potential public health risks). Finally, this project also provides water supply benefits indirectly through the improvements to water quality. The Freeport Regional Water Project intake is located on the Sacramento River, directly downstream of the proposed project. Raw sewage releases to the Sacramento River have the potential to significantly impact river water quality which, in turn, has the potential to result in cessation of river intake operations due to severe water quality concerns. By reducing the potential for combined sewer overflows, these water quality concerns, and subsequently the potential water supply impacts, are ameliorated.

Regional Map

The Upper Unionhouse Creek Flood Protection Project, the Antelope Creek Improvement Project, and the Downtown Combined Sewer Upsizing are all located within the ARB Region, which encompasses much of Sacramento County and the lower watershed portions of Placer and El Dorado Counties. The boundaries of the ARB IRWMP region are defined by the boundaries of the participants' service areas, and include Placer County Water Agency (PCWA), City of Lincoln (Lincoln) and Sacramento County boundaries on the north, the lower watershed boundaries on the east, the Sacramento County boundary on the south (to the west bank of the Sacramento River), and the Sacramento River/Sacramento County line on the west. Most of the region overlies the North American, South American, or the Cosumnes Groundwater Subbasins and/or receives water supply, directly or indirectly, from the American, Sacramento, and/or Cosumnes Rivers. These common water supply sources, and related water supply issues and physical features, link the participating agencies together and make the region appropriate for integrated regional water planning and management.

The DACs in the ARB region were identified by evaluating geographic information system (GIS) files prepared by the U.S. Census Bureau. The data show average income by census tract. DACs are those with an annual median household income (MHI) below 80% of the statewide MHI. The identified DACs are **s**hown in Figure 3. Each DAC lies within the boundary of a water purveyor, city, or county that has been involved in past regional planning efforts. Unlike some parts of the state, the DACs in the Region are not isolated communities with particular water supply or quality concerns (for example, the Central Valley community of Allensworth is isolated with few alternatives to its high-arsenic groundwater supply). The flood protection, water supply and water quality needs of DACs in the ARB region are generally served effectively by water purveyor and/or special district (e.g. SAFCA and PCFCD) efforts to provide high

quality water supplies and a high level of flood protection to their entire service area and through the ARB Region's IRWM planning efforts.

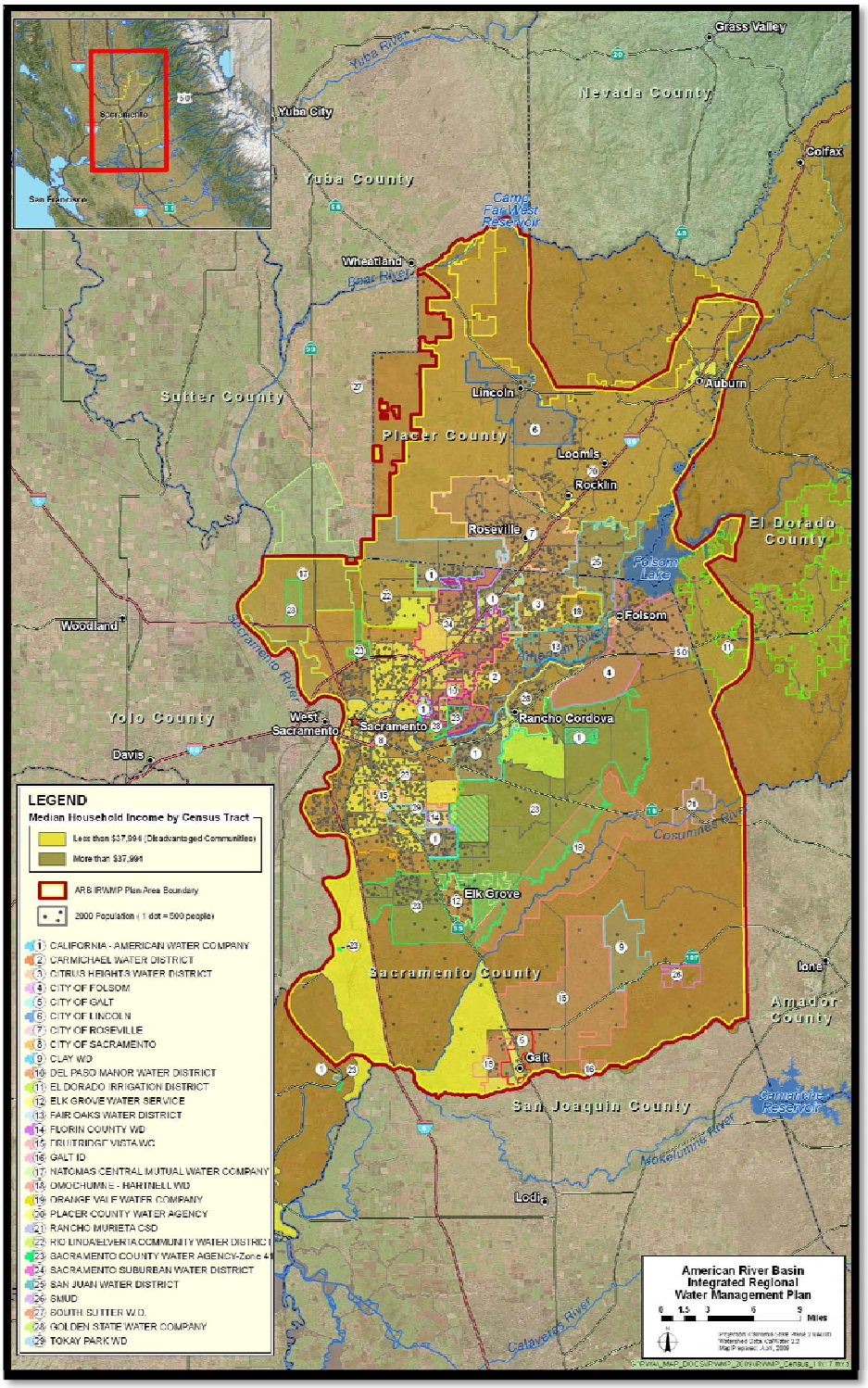

Figure 3: DACs in the ARB Region

Completed Work and Existing Data and Studies

To date, the engineering feasibility study of the Upper Unionhouse Creek Flood Protection Project has been completed and the project is ready to move directly into the permitting and additional design phases. The following studies have been completed in support of that design:

- *Inundation-Reduction Benefit Analysis for Unionhouse Creek Memorandum* (David Ford Consulting Engineers, Inc., March 2011) has recently been completed for the project, demonstrating the feasibility of the Project for increasing flood protection in the Unionhouse Creek Watershed.

Additionally, the 10% Design of the project has been completed. Other assessment studies, including a Phase 1 Site Assessment, a soil study, and surveying work will be completed before the grant date award.

Program Preferences

The implementation of the ARB IRWM Region's proposals for the Upper Unionhouse Creek Flood Protection Project, the Antelope Creek Improvement Project, and the Downtown Combined Sewer Upsizing Project meets multiple Program Preferences presented in the *Proposition 84 & Proposition 1E IRWM Guidelines* (Guidelines, DWR, August 2010) including the following:

- Include regional projects or programs
- Effectively integrate water management programs and projects within a hydrologic region
- Contribute to attainment of one or more of the objectives of the CALFED Bay-Delta Program
- Effectively integrate water management with land use planning
- Address Statewide priorities

Additional detail regarding how these projects contribute to the Program Preferences is included in Attachment 11 of this Proposal.

Project Map

The locations of the ARB IRWM Region's Prop 1E projects (the Upper Unionhouse Creek Flood Protection Project, the Antelope Creek Improvement Project and the Downtown Combined Sewer Upsizing Project) are shown in Figure 2. Monitoring locations for the projects will generally be at the project sites and in the general vicinity of the construction. More detailed maps for each project are included in the Project Tasks section of their respective project proposals.

Project Timing and Phasing

While the ARB IRWM Region's Prop 1E projects (the Upper Unionhouse Creek Flood Protection Project, the Antelope Creek Improvement Project and the Downtown Combined Sewer Upsizing Project) are ready to proceed upon award notification, there is flexibility in terms of delaying commencement of projects. Each of the three submitting agencies (Placer County Flood Control and Water Conservation District, the City of Sacramento and the Sacramento Area Flood Control Agency) is prepared to work with DWR to accommodate the timing of the availability of appropriations from the Proposition 1E bond.

All of the proposed ARB projects (including the one described in this Proposal) are stand-alone projects and do not require the implementation of other phases or projects to provide benefits to the ARB Region. Further, each project is part of a larger, phased project, as described below.

Upper Unionhouse Creek Flood Protection Project

Unionhouse Creek is a tributary to Morrison Creek in the southern part of the City of Sacramento (City) and in unincorporated Sacramento County (County). Both creeks converge just to the west of the Union Pacific Railroad (UPRR) line, about one-half mile north of the Sacramento Regional Waste Water Treatment Plant (Treatment Plant). The portion of Unionhouse Creek between Franklin Boulevard and the UPRR line has been improved as part of the federally-authorized South Sacramento Streams Group (SSSG) Project (Federal Project). A new flood wall has been inserted into the levee along the northern bank of the creek and the southern bank has been lowered to allow high flows to spill into the Beach-Stone Lake floodplain east of the Treatment Plant. This non-federal phase of the larger Morrison Creek watershed flood reduction projects proposes to address the existing flood risk along Unionhouse Creek by expanding the width and adjusting the depth of the existing channel between Franklin Boulevard and Bruceville Road. This project would significantly reduce the likelihood of overbank flooding in this portion of the creek and would provide at least a 100-year level of flood protection to the lands adjacent to the creek in this area, thus removing 250 to 300 homes from the regulated floodplain and relieving the homeowners of the burden of costly flood insurance. Subsequent phases of the larger flood protection effort in the Morrison Creek watershed will further reduce flood damage this area; these phases will be implemented as funding allows.

Antelope Creek Improvement Project

This project is proposed in three phases; the first two phases include the design and construction of two on-channel flood control weirs along Antelope Creek. The Phase 1 weir is located near Atlantic Street in Roseville while the Phase 2 weir is located at the bike path crossing at Roseville Parkway. Phase 3 of the Antelope Creek Improvement Project involves improvements to the upstream Clover Valley Reservoir, which regulates water deliveries in the lower Antelope Canal, and eventually flows into Antelope Creek. The improvements include desilting of the reservoir and constructing a pipeline to bypass the unlined portion of the Antelope Canal that has experienced severe erosion and down-cutting. Although all three phases of the project are in the Antelope Creek Watershed, the timing of the phases does not impact each other.

Downtown Combined Sewer Upsizing Project

In 1990, the Central Valley Regional Water Quality Control Board served the City with a Cease and Desist Order that directed the City to devise a plan to reduce its CSOs and CSS outflows. Over the next four years, the City developed the Combined Sewer System Improvement Program (CSSIP), obtained approval from the Regional Board and City Council, and since then has largely implemented it. This effort, with the ultimate goal of eliminating CSS outflows for 10-year, six hour storms, has resulted thus far in reduction in outflow volumes of about 60% since the inception of the CSSIP, based upon hydraulic model results. This was achieved in earlier project phases by increasing pumping capacity at Sump 1/1A and at Sump 2, and by constructing additional in-line and offline storage. Remaining projects in the first

part of the CSSIP mostly consist of completing the Downtown Sewer Upsizing Project, which, thus far, has been designed and constructed in sections due to funding constraints.

Data Management and Monitoring Deliverables

The ARB IRWM Region adopted data management and plan performance monitoring standards in its May 2006 IRWM Plan. Associated with this, a project database is currently maintained by RWA and a website is used to disseminate plan information (http://www.rwah2o.org/rwa/programs/irwmp/). RWA will be updating its IRWM Plan in 2011 and 2012 as described in the region's September 28, 2010 Prop 84 IRWM Planning Grant Application. One of the key tasks described in the application is the development of a web-based interface where information will be collected and disseminated. The interface will use an input form that, at a minimum, will include all information required to complete a project review process as described on page 21 of the DWR IRWM Guidelines (August 2010). This interface will populate a database developed to store and disseminate information via the web interface. The interface will include an option to upload associated files (for example, a PDF file of project plans). Any required monitoring specific to a project will be collected consistent with applicable standards (for example, SWAMP and CASGEM) and reported to the State. These substantial improvements are scheduled to be completed by August 2011, so they will be in place generally coincident with beginning implementation of the Project in this Proposal. The project proponents of the three ARB IRWM Region proposals (the Antelope Creek Improvement Project, the Downtown Combined Sewer Upsizing Project and the Upper Unionhouse Creek Flood Protection Project) have agreed to coordinate with RWA to acknowledge and commit to the requirements of providing data and monitoring consistent with IRWM guidelines.

Project Tasks

Summarized in the following section is a project work plan for the Upper Unionhouse Creek Flood Protection Project. This project work plan contains a summary description of the Project plus detailed descriptions of each task that will be conducted to implement the Project. These same tasks are reflected under the same project headings in Attachment 4 - Budget and Attachment 5 - Schedule, where the task-specific and overall project budgets and schedules are presented.

Unionhouse Creek is a tributary to Morrison Creek in the southern part of the City of Sacramento (City) and in unincorporated Sacramento County (County). As shown in Figure 1, the two creeks converge just to the west of the Union Pacific Railroad (UPRR) line about one-half mile north of the Sacramento Regional Waste Water Treatment Plant (Treatment Plant). The portion of Unionhouse Creek between Franklin Boulevard and the UPRR line has been improved as part of the Federally authorized South Sacramento Streams Group (SSSG) Project (Federal Project). A new flood wall has been inserted into the levee along the northern bank of the creek and the southern bank has been lowered to allow high flows to spill into the Beach-Stone Lake floodplain east of the Treatment Plant.

East of Franklin Boulevard, the creek is confined to an excavated channel. Hydraulic modeling studies indicate that the portion of the channel between Franklin Boulevard and Center Parkway floods out of bank in 100-year and more frequent storms. The flows exiting the channel inundate low lying urban neighborhoods on both sides of the creek. As shown in the floodplain map attached as Figure 2, the inundated area north of the Creek is larger than the inundated area south of the Creek. The modeling studies indicate that approximately 250 to 300 homes in the inundation area will suffer damage in the event of a 100-year flood.

The authorized scope of the Federal Project includes the Unionhouse Creek channel between Franklin Boulevard and Center Parkway. However, the U. S. Army Corps of Engineers (Corps) has halted design and construction efforts east of Franklin Boulevard pending completion of a Limited Re-evaluation Report to update the hydrology of the watershed and confirm the costs and benefits of extending the Federal Project improvements to this portion of the Creek. The uncertainty created by this pause in the Federal Project has complicated ongoing regional transportation planning efforts in the publically owned corridor adjacent to Unionhouse Creek between Franklin Boulevard and Bruceville Road. This corridor currently contains Cosumnes River Boulevard, a two lane road that extends eastward from Franklin Boulevard to Highway 99. The City plans to expand this roadway into a four-lane expressway that connects Highway 99 and Interstate 5 near the town of Freeport. In addition, the Sacramento Regional Transit Authority (RT) has received Federal approval to extend light rail service though this corridor along the northern edge of the expanded roadway. Neither project can proceed until the flood control issues associated with Unionhouse Creek are resolved.

The Sacramento Area Flood Control Agency (SAFCA) proposes to address the existing flood risk along Unionhouse Creek by expanding the width and adjusting the depth of the existing channel between Franklin Boulevard and Bruceville Road. This project would significantly reduce the likelihood of overbank flooding in this portion of the creek and would provide at least a 100-year level of flood protection to the lands adjacent to the creek in this area thus removing the 250 to 300 homes from the

regulated floodplain and relieving the homeowners of the burden of costly flood insurance. If this project is funded through Proposition 1E, the Federal Project on Unionhouse Creek would terminate at Franklin Boulevard. This would lessen current funding demands on the Federal Project and enable the funds currently remaining within the authorized project cost ceiling to be used for flood damage reduction along Morrison Creek and its tributaries north of Unionhouse Creek (all within the State Plan for Flood Control). In addition, the proposed grant project could be designed and constructed within twelve months of the award of the grant. This would allow for appropriate coordination with the transportation agencies on the allocation of space within the publically owned corridor and eliminate flood planning uncertainties that might otherwise prevent timely construction of the planned light rail and roadway improvements in the corridor.

Between Strawberry Creek immediately downstream of Bruceville Road and Center Parkway, the existing 2,800-foot trapezoidal channel would be widened to the south by up to 17 feet to a width of 75 feet with a new 2H:1V side slope and a widened channel bottom of up to 26.25 feet. The existing concrete channel bottom in this reach of the creek would be left in place for continued maintenance of the channel, and a concrete curb would be added between the concrete bottom and the earthen bottom. Between Center Parkway and Franklin Boulevard, the existing 5,400 foot trapezoidal channel would be widened to the south by up to 17 feet to a width of 75 feet with a new 2H:1V:side slope. The existing concrete channel bottom would be demolished and removed, the channel would be slightly deepened and a new concrete bottom would be installed across the width of the widened channel, which could be up to 24.5 feet. The increase in channel width upstream and downstream of Center Parkway would be achieved through adjustments in the planned light rail and roadway improvements in the corridor[1]. Soil material excavated from the channel would be stored in the City's right of way between the channel and Cosumnes River Boulevard. This material would be collected and hauled off by RT for use in their construction of a new bridge to elevate their planned light rail line over Morrison Creek and the UPRR line.

Agency Involvement

The implementing agency for this project would be the Sacramento Area Flood Control Agency (SAFCA). Cooperating agencies include: City of Sacramento (owner of a portion of the channel right-of-way land), Sacramento Regional Transit District (RT) (coordinated transit project), California Department of Water Resources (state sponsor of downstream and in-watershed flood protection projects), U.S. Army Corps of Engineers (federal sponsor of downstream and in-watershed flood protection projects).

Project Benefits

The Upper Unionhouse Creek Flood Protection Project would provide multiple benefits. These include the following:

- Reduce flooding concerns in the Unionhouse Creek floodplain by providing increased stormwater passage.

[1] The adjustments would consist of reducing the width of the planned multi-use trail along the north bank of Unionhouse Creek by 1 foot; reducing the width of the shoulders of the planned 4-lane Cosumnes River Boulevard (CRB) by 1 foot each; and reducing the width of the planned CRB median by 4 feet.

- Support development of the currently-threatened extension of the light rail from downtown Sacramento to Cosumnes River College (a project which will reduce pollution and traffic congestion and contribute to sustainable development) by reducing potential flooding impacts to the project, allowing for transportation project funding and permitting.
- Resolve flooding issues in the Unionhouse Creek Watershed, thus lessening the cost of the SSSG Federal Project and leveraging authorized Federal Project funding to focus on flood problems elsewhere in the Morrison Creek Watershed.

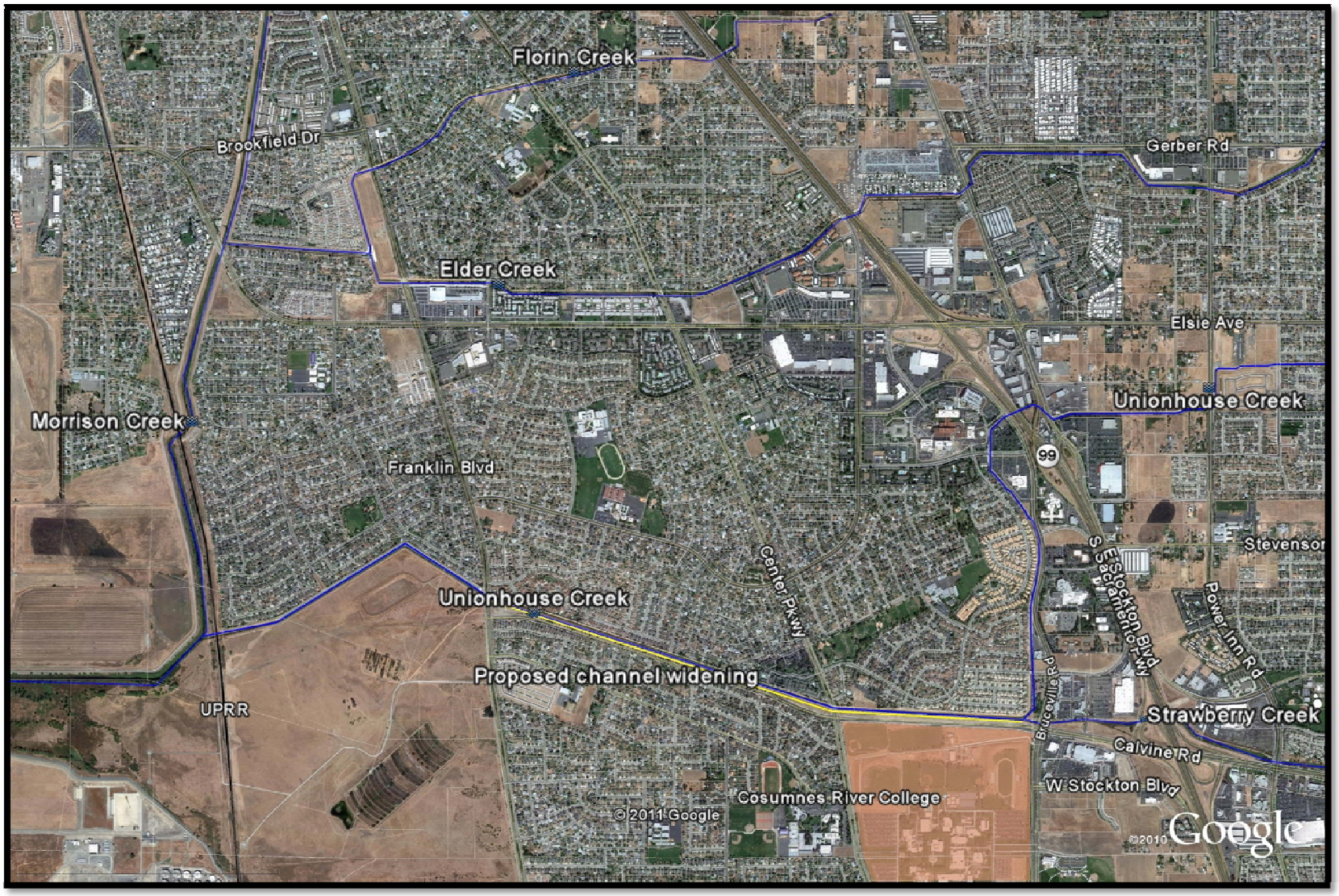

Figure 4: Location of Upper Unionhouse Creek Flood Protection Project

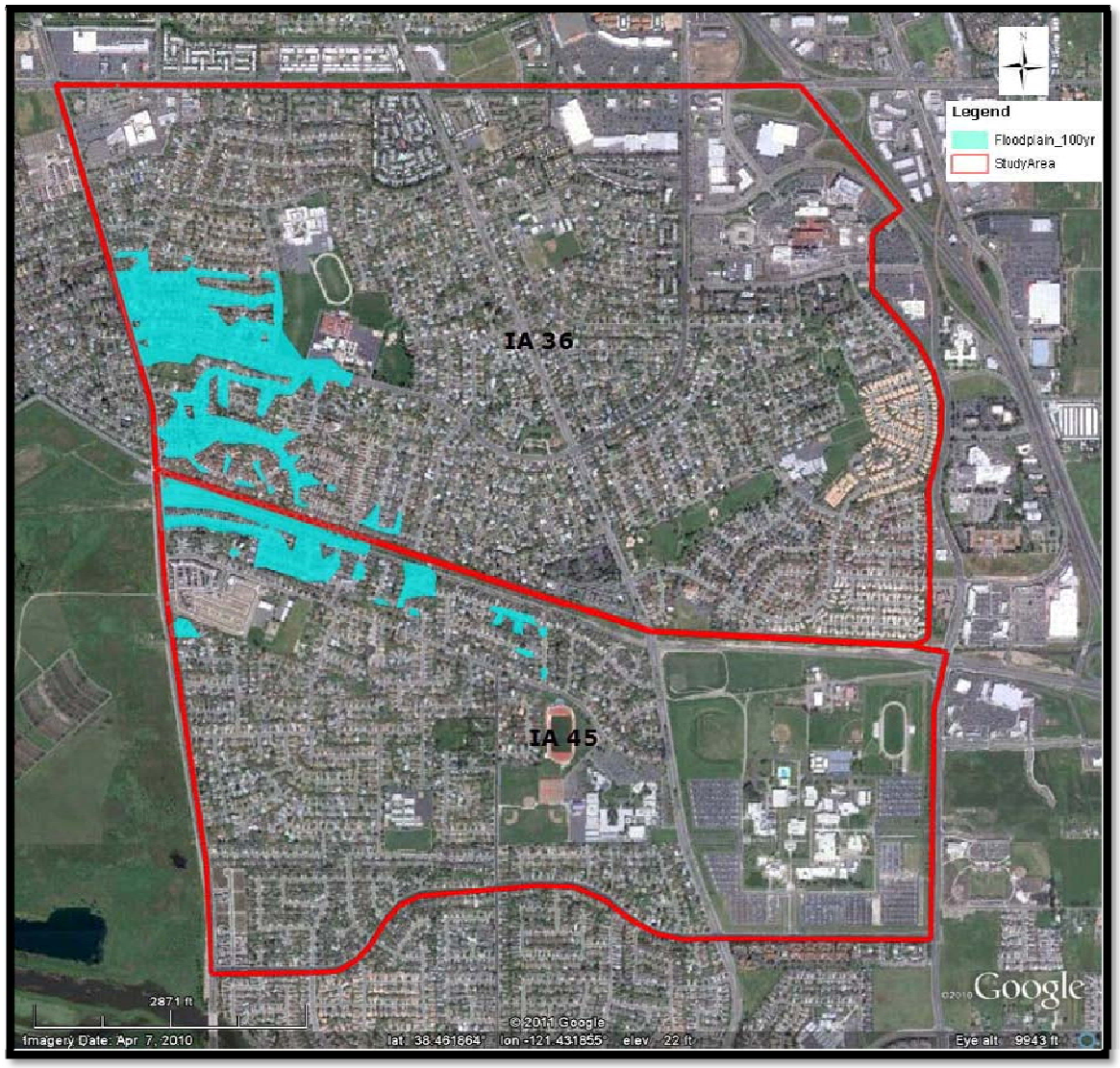

Figure 5: 100-Year Flood Inundation without the Upper Unionhouse Creek Flood Protection Project

Budget Category (a): Direct Project Administration Costs

Direct project administration costs include general project administration tasks (claim preparation, communications with the California Department of Water Resources (DWR), and Board communications), Labor Compliance Program (LCP) implementation, and reporting (quarterly reports and final report). Included under this budget category are three tasks: administration, a labor compliance program, and reporting.

Task 1: Administration

Work to be completed as park of Task 1, Administration, includes Board communications, project status meetings, and communications with DWR, contractors and various City agencies. For this project, the Sacramento Area Flood Control Agency (SAFCA) will be the primary project sponsor, and as such, will be primarily responsible for project administration.

Task 2: Labor Compliance Program

SAFCA will use the services of the City of Sacramento construction management personnel for labor compliance. The labor compliance services will include, at a minimum, monitoring and preparation of summary and status reports, receiving, reviewing and processing certified payroll reports, conducting interviews, as well as collecting, reviewing, and processing other data. Annual reports to the Department of Industrial Relations (DIR) will also be prepared and submitted.

Task 2 Deliverables:

- Certified Labor Compliance Program
- Annual DIR Reports

Task 3: Reporting

Following execution of the grant agreement, quarterly reports will be prepared assessing the progress and accomplishments of the Upper Unionhouse Creek Flood Protection Project. A project completion report will also be prepared at the end of the project, anticipated to be in July 2012. SAFCA will keep all records and documents pertaining to the project for three years after the project completion.

Task 3 Deliverables:

- Quarterly reports as specified in the Grant Agreement
- Completion report as specified in the Grant Agreement

Budget Category (b): Land Purchase/Easement

The existing upper Unionhouse Creek channel is already in public ownership; however some easement acquisition will be required from the City of Sacramento and Cosumnes River College to enlarge the channel as proposed. Land purchase and easement acquisition would be completed prior to the start of construction which is scheduled to begin in April 2012.

Budget Category (c): Planning/Design/Engineering/Environmental Documentation

Currently, the project has completed the conceptual (10%) design. A flood modeling study, described below, has recently been completed to evaluate the feasibility of the project. Further planning evaluations will be completed in May and June 2011. Design will begin in May 2011, and is expected to be completed in December 2011. A Mitigated Negative Declaration (MND) is expected to be completed for compliance with the California Environmental Quality Act (CEQA) in September 2011.

Task 4: Assessment and Evaluation

The *Inundation-Reduction Benefit Analysis for Unionhouse Creek Memorandum* (David Ford Consulting Engineers, Inc., March 2011) was recently completed for the project, demonstrating the feasibility of the project for increasing flood protection in the Unionhouse Creek watershed.

The following studies have yet to be completed and will be conducted as part of the project:

- A Cadastral and topographic survey will be completed in June 2011.
- A Geotechnical study will be completed in May 2011 to evaluate geologic conditions at the site.
- A Phase 1 Site Assessment will be completed in June 2011 to identify the presence of any hazardous waste.

Task 4 Deliverables:

- Survey Drawings
- Geotechnical Report
- Phase 1 Site Assessment Report

Task 5: Final Design

The conceptual (10%) design of this project has been completed. Four design submittals are expected for this project, corresponding to the 30%, 60%, 90% and 100% (final) design documents. A design consultant will be hired in May 2011 to complete the design.

During design, ASTM Construction Standards and Occupational Safety and Health Administration (OSHA) regulations and industry standard practice will be used as construction standards and health and safety standards.

Task 5 Deliverables:

- 30% Design
- 60% Design
- 90% (pre-final) Design
- Final Plans and Specifications

Task 6: Environmental Documentation

A consultant will be hired to draft a Mitigated Negative Declaration (MND) for this project to comply with the California Environmental Quality Act (CEQA). The MND will be circulated in August 2011, followed by a public review period and SAFCA Board approval of the MND in September 2011.

Task 6 Deliverables:

- Approved Mitigated Negative Declaration

Task 7: Permitting

The following permits will be required to implement the Upper Unionhouse Creek Flood Protection Project and all of the permits are expected to be issued by February 2012, prior to start of construction.

- California Department of Fish and Game (CDFG) Section 1602 Streambed Alteration Agreement allowing for work within the stream channel.
- U.S. Army Corps of Engineers (ACOE) Section 404 Encroachment Permit to allow work within waters of the U.S.
- Section 7 Endangered Species Act Consultation with the US Fish and Wildlife Service and the National Marine Fisheries Service.
- Regional Water Quality Control Board (RWQCB) 401 Water Certification to ensure compliance with State water quality standards.
- A Central Valley Flood Protection Board Encroachment Permit (CVFPB) to ensure the proposed project does not impact flood control efforts.

Task 7 Deliverables:

- Complete permit package including all permits

Budget Category (d): Construction/Implementation

Task 8: Construction Contracting

Pre-construction work to be completed under Task 8 will begin in December 2011. Work items include Bid Advertisements, Notices of Award (NOA), Notices to Proceed (NTP), and monthly progress reports. The Bid Package to be used for bid solicitation will be prepared under this task and will include the final plans and specifications that were prepared during Task 5. SAFCA anticipates releasing the Notice to Bidders in December 2011 with the NOA to occur in March 2012 and NTP to be released in April of 2012. Construction Submittal will include Insurance Requirements, the NTP, and a Stormwater Pollution Prevention Plan (SWPPP).

Task 8 Deliverables:

- Notices of Award
- Notices to Proceed
- Monthly Progress Reports

Task 9: Construction

Construction of the Upper Unionhouse Creek Flood Protection Project is expected to begin in April 2012 and to be completed in July 2012. Task 9 is divided into three subtasks: Mobilization and Site Preparation, Project Construction, and Performance Testing and Demobilization, as described in the following sections.

Mobilization and Site Preparation

Upon receipt of the NTP, the contractor will begin mobilization and site preparation activities. These activities will include establishing the contractor work area, delivering equipment to the site, and implementing any SWPPP measures at the construction site and at the soil disposal site as needed.

Project Construction

Following completion of all site preparation and mobilization, the contractor will perform project construction activities. The channel widening and deepening construction activities include demolition and removal of the concrete channel bottom, excavation of the channel with hauling to disposal sites, and forming and pouring the new concrete channel bottom. In addition, the excavated slopes will be hydroseeded.

Performance Testing and Demobilization

Following completion of construction activities, the contractor will perform site clean-up and stabilization and restoration activities. This includes geotechnical testing of flood control weir base materials, earthwork compaction testing, concrete materials testing and plant establishment and monitoring of the native plants.

Final inspection and project certification will also be performed, along with contractor demobilization.

Budget Category (e): Environmental Compliance/Mitigation/Enhancement

Task 10: Environmental Compliance/Mitigation/Enhancement

As the Upper Unionhouse Creek Flood Protection Project will occur in an existing public right-of-way in a channel that already has a concrete bottom, anticipated impacts are expected to be minimal. Environmental compliance, mitigation, and enhancement actions associated with this project are expected to be minimal and primarily focused on habitat restoration. Appropriate project mitigation measures will be identified during the environmental documentation and permitting tasks, and appropriate documents (such as a site restoration plan) prepared as part of that process.

A project-specific Project Performance Monitoring Plan will be prepared under Task 12 to direct longer-term project monitoring to ensure successful project implementation and operation. It should be noted that, while the schedule for this project shows that project performance monitoring and reporting will cease at the completion of project construction, it is understood the project performance monitoring will continue for 10 years following project completion, with annual project performance reporting.

Budget Category (f): Construction Administration

Task 11: Construction Administration

Construction Administration includes Construction Management services and other administrative activities relating to project implementation. General contract administration and field inspections will be performed by SAFCA staff.

Construction management for the project will include the following work items:

- Review contractor's schedule and make recommendations
- Manage and coordinate all project inquiries, serve as focal point
- Manage and coordinate all contractor correspondence
- Maintain detailed project records
- Receive, log, and distribute all submittals for review
- Inspect completed construction
- Recommend final payment and submit all project files for archiving

Budget Category (g): Other Costs

Included in this budget category are permit fees and Task 12, Project Performance Monitoring Plan.

Task 12: Project Performance Plan

As part of the overall grant proposal, a Project Performance Monitoring Plan will be prepared for implementation under the grant award. This plan will be prepared to:

- Provide a framework for assessment and evaluation of project performance.
- Identify measures that can be used to monitor progress toward achieving project goals.
- Provide a tool to monitor and measure project process and guide final project performance reporting that will fulfill grant agreement requirements.
- Provide information to help improve current and future projects.
- Maximize the value of public expenditures to achieve desired environmental results.

This document will identify the problem to be addressed by the project, summarize the project tasks, specifying the project goals and desired outcomes, and include a project performance measures table presenting output and outcome indicators, measurements tool and methods to be implemented, and performance targets.

Task 12 Deliverables:

- Project Performance Monitoring Plan

Budget Category (h): Construction/ Implementation Contingency

A construction contingency of 25% will be used for this project for all construction costs and is based on prior project experience and engineering practice.

Supporting Documentation

The following supporting documents are included for this proposal:

- *Inundation-Reduction Benefit Analysis for Unionhouse Creek Memorandum* (David Ford Consulting Engineers, Inc., March 2011)
- *American River-Folsom Modifications Economic Analysis* (US Army Corps of Engineers, 2001)
- *American River Watershed, California Folsom Dam Modification Project, Final Limited Reevaluation Report* (US Army Corps of Engineers, August 2001)
- *American River Watershed, California Folsom Dam Modification Project, Draft Economic Reevaluation Project* (US Army Corps of Engineers , May 2007)